CHAPTER 60
NOMENCLATURE

Topic 61 - Abbreviations

Index 61.1 - Official Names

AASHTO	American Association of State Highway and Transportation Officials
DOT	U.S. Department of Transportation
FHWA	Federal Highway Administration
Caltrans or Department	California Department of Transportation
CFR	Code of Federal Regulations
CTC or Commission	California Transportation Commission
DOD	Division of Design
District	Department of Transportation Districts
FAA	Federal Aviation Administration
PUC	Public Utilities Commission
PS&E	Plans, Specifications, and Estimate
STIP	State Transportation Improvement Program
DES	Division of Engineering Services
METS	Office of Materials Engineering and Testing Services
GS	Geotechnical Services
SD	Structure Design

Topic 62 - Definitions

62.1 Geometric Cross Section

(1) Lane.

(a) Auxiliary Lane--The portion of the roadway for weaving, truck climbing, speed change, or for other purposes supplementary to through traffic movement.

(b) Lane Numbering--On a multilane roadway, the traffic lanes available for through traffic traveling in the same direction are numbered from left to right when facing in the direction of traffic flow.

(c) Multiple Lanes--Freeways and conventional highways are sometimes defined by the number of through traffic lanes in both directions. Thus an 8-lane freeway has 4 through traffic lanes in each direction. Likewise, a 4-lane conventional highway has 2 through traffic lanes in each direction.

(d) Median Lane--A speed change lane within the median to accommodate left turning vehicles.

(e) Separate Turning Lane--An auxiliary lane for traffic in one direction which has been physically separated from the intersection area by a traffic island.

(f) Speed Change Lane--An auxiliary lane, including tapered areas, primarily for the acceleration or deceleration of vehicles entering or leaving the through traffic lanes.

(g) Traffic Lane--The portion of the traveled way for the movement of a single line of vehicles.

(2) Median. The portion of a divided highway separating the traveled ways for traffic in opposite directions.

(3) Outer Separation. The portion of an arterial highway between the traveled ways of a roadway for through traffic and a frontage street or road.

(4) Roadbed. That portion of the roadway extending from curb line to curb line or shoulder line to shoulder line. Divided highways are considered to have two roadbeds.

(5) Roadside. A general term denoting the area adjoining the outer edge of the roadbed to the right of way line. Extensive areas between the roadbeds of a divided highway may also be considered roadside.

(6) Roadway. That portion of the highway included between the outside lines of the sidewalks, or curbs and gutters, or side ditches including also the appertaining structures, and all slopes, ditches, channels, waterways, and other features necessary for proper drainage and protection.

(7) Shoulder. The portion of the roadway contiguous with the traveled way for accommodations of stopped vehicles, for

emergency use, and for lateral support of base and surface courses.

(8) Traveled Way. The portion of the roadway for the movement of vehicles, exclusive of shoulders.

62.2 Highway Structures

(1) Illustration of Types of Structures. Figure 62.2 illustrates the names given to common types of structures used in highway construction. This nomenclature must be used in all phases of planning.

(2) Bridges. Structures that span more than 6.1 m, measured along the centerline of the road between undercopings of abutments, and multiple span structures, including culverts, where the total measurement of the individual spans are in excess of 6.1 m, measured from center to center of supports along the centerline of the road and the distance between individual culvert barrels is less than one-half the culvert diameter. Culverts that fit the definition of a bridge will be designed and maintained by the Division of Engineering Services - Structures Design and assigned a bridge number.

(3) Culverts. See Index 806.2.

62.3 Highway Types

(1) Freeway. A freeway, as defined by statute, is a highway in respect to which the owners of abutting lands have no right or easement of access to or from their abutting lands or in respect to which such owners have only limited or restricted right or easement of access. This statutory definition also includes expressways.

The engineering definitions for use in this manual are:

(a) Freeway--A divided arterial highway with full control of access and with grade separations at intersections.

(b) Expressway--An arterial highway with at least partial control of access, which may or may not be divided or have grade separations at intersections.

(2) Controlled Access Highway. In situations where it has been determined advisable by the Director or the CTC, a facility may be designated a "controlled access highway" in lieu of the designation "freeway". All statutory provisions pertaining to freeways and expressways apply to controlled access highways.

(3) Conventional Highway. A highway without control of access which may or may not be divided. Grade separations at intersections or access control may be used when justified at spot locations.

(4) Highway.

(a) Arterial Highway--A general term denoting a highway primarily for through traffic usually on a continuous route.

(b) Bypass--An arterial highway that permits traffic to avoid part or all of an urban area.

(c) Divided Highway--A highway with separated roadbeds for traffic in opposing directions.

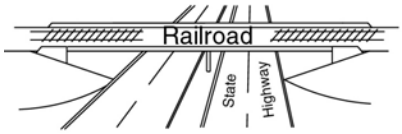
(d) Major Street or Major Highway--An arterial highway with intersections at grade and direct access to abutting property and on which geometric design and traffic control measures are used to expedite the safe movement of through traffic.

(e) Radial Highway--An arterial highway leading to or from an urban center.

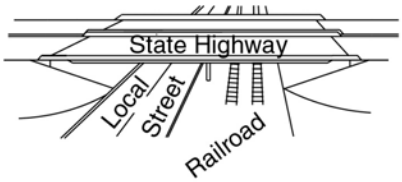
(f) Through Street or Through Highway--Every highway or portion thereof at the entrance to which vehicular traffic from intersecting highways is regulated by stop signs or traffic control signals or is controlled when entering on a separate right-turn roadway by a yield-right-of-way sign.

(5) Parkway. An arterial highway for noncommercial traffic, with full or partial control of access, and usually located within a park or a ribbon of park-like development.

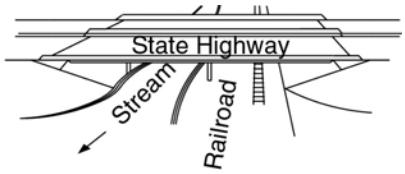
Figure 62.2
Types of Structures



UNDERPASS

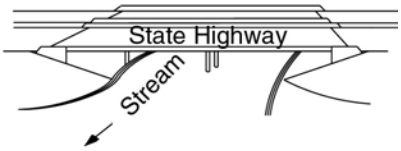


OVERHEAD

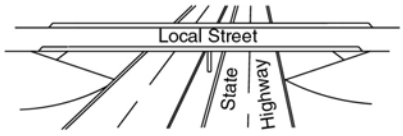


BRIDGE & OVERHEAD

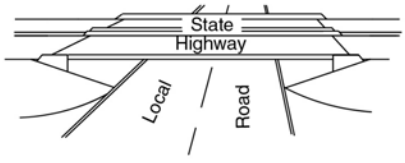
VIADUCT



BRIDGE



OVERCROSSING



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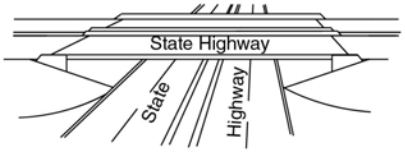

SEPARATION

(6) Scenic Highway. An officially designated portion of the State Highway System traversing areas of outstanding scenic beauty which together with the adjacent scenic corridors requires special scenic conservation treatment.

(7) Street or Road.

(a) Cul-de-Sac Street--A local street open at one end only, with special provisions for turning around.

(b) Dead End Street--A local street open at one end only, without special provisions for turning around.

(c) Frontage Street or Road--A local street or road auxiliary to and located on the side of an arterial highway for service to abutting property and adjacent areas and for control of access.

(d) Local Street or Local Road--A street or road primarily for access to residence, business, or other abutting property.

(e) Toll Road, Bridge or Tunnel--A highway, bridge, or tunnel open to traffic only upon payment of a direct toll or fee.

62.4 Interchanges and Intersections at Grade

(1) Channelization. The separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavement markings, raised islands, or other suitable means to facilitate the safe and orderly movement of both vehicles and pedestrians.

(2) Geometric Design. Geometric design is the arrangement of the visible elements of a road, such as alignment, grades, sight distances, widths, slopes, etc.

(3) Gore. The area immediately beyond the divergence of two roadbeds bounded by the edges of those roadbeds.

(4) Grade Separation. A crossing of two highways or a highway and a railroad at different levels.

(5) Interchange. A system of interconnecting roadways in conjunction with one or more grade separations providing for the interchange of traffic between two or more roadways on different levels.

(6) Interchange Elements.

(a) Branch Connection--A multilane connection between two freeways.

(b) Freeway-to-freeway Connection--A single or multilane connection between freeways.

(c) Ramp--A connecting roadway between a freeway or expressway and another highway, road, or roadside area.

(7) Intersection. The general area where two or more roadways join or cross, within which are included roadside facilities for traffic movements in that area.

(8) Island. A defined area between traffic lanes for control of vehicle movements or for pedestrian refuge. Within an intersection a median or an outer separation is considered an island.

(9) Minimum Turning Radius. The radius of the path of the outer front wheel of a vehicle making its sharpest turn.

(10) Skew Angle. The complement of the acute angle between two centerlines which cross.

(11) Weaving Section. A length of one-way roadway, designed to accommodate weaving, at one end of which two one-way roadways merge and at the other end of which they separate.

62.5 Landscape Architecture

(1) Highway Planting. Vegetation placed for aesthetic, safety, environmental mitigation, storm water pollution prevention or erosion control purposes, including necessary irrigation systems, inert materials, mulches and appurtenances. Highway planting provides for a level of planting that makes the right of way compatible with the surrounding environment up to the allowable maximum cost-per-hectare (adjusted annually), as determined by

the Office of State Landscape Architecture. Highway planting is warranted on new highways where adjacent properties are developed at the time the highway contract is accepted; on existing highways where adjacent properties have been developed at the time the highway contract is accepted for construction of a new interchange or major modification of an existing interchange; and on existing highways where adjacent properties were developed on or before June 30, 1987.

In addition, highway planting may be required to satisfy written agreements or memorandum of understanding between the State and another governmental agency, or mitigate impacts as required in an environmental document or by court order.

If legally required, the allowable maximum cost-per-hectare may be exceeded.

(2) *Revegetation.* Planting of indigenous plants to replace natural vegetation that is damaged or removed as a result of highway construction projects or permit requirements. This work may include provisions for irrigation. Planting to restore existing eroding slope for reduction of maintenance effort, traveler safety and improved water pollution control is included.

(3) *Replacement Planting.* Planting to replace planting (installed by Caltrans or others) that is damaged or removed during highway construction activity, including irrigation modification and/or replacement.

Unless the environmental document or memorandum of understanding with the local agency specifies otherwise, highway planting work including replacement is done as a separate contract from the highway construction work. Exceptions may be permitted with approval of the Office of State Landscape Architecture District Coordinator when justified.

(4) *Highway Planting Restoration.* The renovation or rehabilitation of planting areas and irrigation systems to reduce maintenance expenditures, improve roadside working conditions, reduce water consumption or utilize nonpotable water. Restoration is justified when capital costs can be recovered through maintenance savings within 12 years. Improvement of working conditions, installation of Remote Irrigation Control System (RICS), and conversion to nonpotable water does not require a 12 year payback.

(5) *Erosion Control.* Vegetation, and other materials, such as duff, topsoil, straw, fiber, mulch or compost stabilizing emulsion, protective blankets, etc., placed to stabilize areas disturbed by grading operations, reduce loss of soil due to the action of water or wind, and prevent water pollution.

(6) *Landscaped Freeway.* A designation, as defined in Chapter 6, Title 4 of the California Administrative Code, given to a section of freeway relative to the regulation of outdoor advertising displays.

(7) *Safety Roadside Rest.* A roadside area provided for motorists to stop and rest for short periods. It includes paved parking areas, drinking water, restrooms, tables, benches, telephones, information panels, and may include other facilities (see Topic 903).

(8) *Vista Point.* A paved area beyond the shoulder which permits travelers to safely exit the highway to stop and view a scenic area. In addition to parking areas, trash receptacles, interpretive displays, and in some cases rest rooms, drinking water and telephones may be provided (see Topic 904).

62.6 Right of Way

(1) *Acquisition.* The process of obtaining right of way.

(2) *Air Rights.* The property rights for the control or specific use of a designated airspace involving a highway.

(3) *Appraisal.* An expert opinion of the market value of property including damages and special benefits, if any, as of a specified date, resulting from an analysis of facts.

(4) *Condemnation.* The process by which property is acquired for public purposes

through legal proceedings under power of eminent domain.

(5) *Control of Access.* The condition where the right of owners or occupants of abutting land or other persons to access in connection with a highway is fully or partially controlled by public authority.

(6) *Easement.* A right to use or control the property of another for designated purposes.

(7) *Eminent Domain.* The power to take private property for public use without the owner's consent upon payment of just compensation.

(8) *Encroachment.* Occupancy of project right of way by non-project structures or objects of any kind or character.

(9) *Inverse Condemnation.* The legal process which may be initiated by a property owner to compel the payment of just compensation where the property has been taken or damaged for a public purpose.

(10) *Negotiation.* The process by which property is sought to be acquired for project purposes through mutual agreement upon the terms for transfer of such property.

(11) *Partial Acquisition.* The acquisition of a portion of a parcel of property.

(12) *Relinquishment.* A transfer of the State's right, title, and interest in and to a highway, or portion thereof, to a city or county.

(13) *Right of Access.* The right of an abutting land owner for entrance to or exit from a public road.

(14) *Severance Damages.* Loss in value of the remainder of a parcel which may result from a partial taking of real property and/or from the project.

(15) *Vacation.* The reversion of title to the owner of the underlying fee where an easement for highway purposes is no longer needed.

62.7 Pavement Structural Section

The following list of definitions includes a number of terms that are not commonly used in California. Some are terms which are included in the "AASHTO Guide for the Design of Pavement Structures" and may be used by FHWA, local agencies, consultants, etc., when discussing pavement structural sections. Some are common terms in pavement design and research publications that the PE may want to read.

(1) *Asphalt Treated Permeable Base (ATPB).* A highly permeable open-graded mixture of crushed coarse aggregate and asphalt binder of planned thickness placed as the base layer to assure adequate drainage of the structural section, as well as structural support.

(2) *Base.* A layer of selected, processed, and/or treated aggregate material of planned thickness and quality placed immediately below the pavement and above the subbase or basement soil to support the pavement.

(3) *Basement Soil/Material.* The natural soil or rock material in excavation or embankments underlying the lowest layer of subbase, base, pavement surfacing or other specified layer which is to be placed.

(4) *Borrow.* Natural soil obtained from sources outside the roadway prism to make up a deficiency in excavation quantities.

(5) *Capital Preventive Maintenance (CAP-M).* A maintenance program which funds work that is performed to preserve the existing pavement structural section utilizing strategies that extend pavement service life for a minimum of 5 years. (For more detailed discussion and sample strategies, see CAP-M Guidelines by the Division of Maintenance.)

(6) *Cement Treated Permeable Base (CTPB).* A highly permeable open-graded mixture of coarse aggregate, portland cement, and water placed as the base layer to provide adequate drainage of the structural section, as well as structural support.

(7) *Crack.* Separation of the materials due to natural causes, traffic action, or reflections from an underlying pavement.

(8) *Deflection.* The downward vertical movement of a pavement surface due to the application of a load to the surface.

(9) *Dense Graded Asphalt Concrete (DGAC).* A uniformly graded asphalt concrete mixture (aggregate and paving asphalt), containing a small percentage of voids, used primarily as a surface layer to provide the structural strength needed to distribute loads to underlying layers of the structural section.

(10) *Depression.* Localized low areas of limited size that may or may not be accompanied by cracking.

(11) *Design Period.* The period of time for which traffic is forecasted.

(12) *Dowel Bar.* A load transfer device in a rigid slab usually consisting of a plain round steel bar.

(13) *Edge Drain System.* A drainage system, consisting of a slotted plastic collector pipe encapsulated in treated permeable material and a filter fabric barrier, with unslotted plastic pipe vents, outlets, and cleanouts, designed to drain the structural section of both rigid and flexible pavements.

(14) *Embankment.* A prism of earth that is constructed from excavated or borrowed natural soil and/or rock, extending from original ground to the grading plane, and designed to provide a stable support for the pavement structural section.

(15) *Equivalent Single Axle Loads (ESAL's).* Summation of equivalent 80 kN single axle loads used to convert mixed traffic to design traffic for the design period.

(16) *Flexible Pavement.* A traffic load carrying system that is made up of one or more layers that are designed to transmit and distribute that loading to the underlying roadbed material. The highest quality layer is the surface course (generally asphalt concrete), which is usually underlaid by a lesser quality base, and in turn a subbase. It is called flexible because it can tolerate deflection bending under heavy loads.

(17) *Grading Plane.* The surface of the basement material upon which the lowest layer of subbase, base, pavement surfacing, or other specified layer is placed.

(18) *Hot Recycling.* The use of reclaimed asphalt concrete pavement which is combined with virgin aggregates, asphalt, and sometimes rejuvenating agents at a central hot-mix plant and placed in the structural section in lieu of all new materials.

(19) *Joint Seals.* Pourable, extrudable, or premolded materials that are placed primarily in transverse and longitudinal joints in or along the edge of concrete pavement to deter the entry of water and incompressible materials (such as sand that is broadcast in freeze-thaw areas to improve skid resistance).

(20) *Lean Concrete Base.* Mixture of aggregate, portland cement, water, and optional admixtures, primarily used as a base for portland cement concrete pavement.

(21) *Longitudinal Joint.* A joint normally placed between traffic lanes in rigid pavements to control longitudinal cracking, and the joint between the traveled way and the shoulder.

(22) *Maintenance.* The preservation of the entire roadway, including pavement surface and structural section, shoulders, roadsides, structures, and such traffic control devices as are necessary for its safe and efficient utilization.

(23) *New Construction.* Constructing a new facility or widening an existing facility on land parcels where there are no existing improvements.

(24) *Open Graded Asphalt Concrete (OGAC).* An open graded mixture of aggregate and a relatively high asphalt content which provides good skid resistance and a high permeability. OGAC is designed to accommodate rapid surface drainage and minimize the potential for hydroplaning while providing an effective seal of the underlying asphalt concrete pavement.

(25) *Overlay.* A layer, usually asphalt concrete, placed on existing asphalt or portland cement concrete pavement to restore ride quality, to increase structural strength (load carrying capacity), and to extend the service life.

(26) *Pavement.* The surface layer of the structural section that carries traffic. Except for special or experimental surface layers, the pavement is either portland cement concrete or asphalt concrete. The asphalt concrete layer may include up to a 30 mm layer of Open Graded Asphalt Concrete (OGAC).

(27) *Pavement Rehabilitation.* Work undertaken to extend the service life of an existing facility. This includes placement of additional surfacing and/or other work necessary to return an existing roadway, including shoulders, to a condition of structural or functional adequacy, for the specified service life. This might include the partial or complete removal and replacement of portions of the pavement structural section.

(28) *Pavement Service Life.* The period of time that a newly constructed or rehabilitated pavement structural section is designed to perform before reaching its terminal serviceability or a condition that requires major rehabilitation or reconstruction; this is also referred to as the performance period.

(29) *Pavement Structure.* See Structural Section.

(30) *Performance Period.* See Pavement Service Life.

(31) *Pumping.* The ejection of base and subgrade material, either wet or dry, through joints or cracks, or along edges of rigid slabs resulting from vertical movements of the slab under traffic. This phenomenon is especially pronounced with saturated structural sections.

(32) *Raveling.* Progressive disintegration of the surface downward on asphalt concrete pavement by dislodged aggregate particles and binder. Stripping usually precedes raveling.

(33) *Reconstruction.* Improvements to an existing facility to meet current design standards and/or to provide increased capacity, safety, efficiency, or significant changes to the horizontal or vertical alignments.

(34) *Resurfacing.* An additional surface layer, or the replacement of the surface layer, placed on an existing pavement to restore its riding quality or to increase its structural (load carrying) strength.

(35) *Rigid Pavement.* Primarily portland cement concrete pavement which distributes the superimposed axle loads over a relatively wide area of underlying structural section layers and soil because of its rigidity and high modulus of elasticity.

(36) *Roadbed.* That area between the intersection of the upper surface of the roadway and the side slopes or curb lines. The roadbed rises in elevation as each increment or layer of subbase, base, or pavement is placed. A divided highway with a median so wide as to include areas of undisturbed land is considered as including two separate roadbeds. See also 62.3(4)(c).

(37) *Routine Maintenance (Traditional).* Work, performed either by contract or by State forces, that preserves the ride quality, safety characteristics, functional serviceability, and structural integrity of the structural section.

For flexible pavement, this includes strategies to correct for: low skid resistance, cracking, raveling, corrugations, loss of lateral support, wheel grooving, potholes, settlement, heave or distortion, bridge approach settlement, base failure, drip track erosion, and abrupt vertical surface differential.

For rigid pavements, maintenance includes strategies to correct for: low skid resistance, proper drainage, cracking, shoulder drop-off, slab warp, spalling, slab settlement, heave or distortion, bridge approach settlement, base failure, joint separation, checking, joint sealing, and abrupt vertical surface differential.

(38) *Rutting.* Longitudinal depressions that develop in the wheel paths under traffic. This permanent and sometimes progressive deformation is most often caused by unstable pavement, inadequate strength of the underlying foundation, chains or studded tire abrasion, or raveling.

(39) *R-value.* Resistance value of treated or untreated soil or aggregate as determined by the stabilometer test (California Test Method 301). This is a measure of the supporting strength of the basement soil and subsequent layers used in the design of pavement structural sections.

(40) *Serviceability.* A pavement's ability to serve the traffic which uses the facility. The primary measure of serviceability is the Present Serviceability Index (PSI), which ranges from 0 (impassible road) to 5 (perfect road).

(41) *Settlement.* Localized vertical displacement of the pavement structural section due to slippage or consolidation of the underlying basement soil/material, often resulting in pavement cracking, poor ride quality, and deterioration.

(42) *Stripping.* The loss of the adhesive bond between asphalt cement and aggregate, most often caused by the presence of water in asphalt concrete, which may result in raveling, and the loss of stability and load carrying capacity of the asphalt concrete pavement or treated base.

(43) *Structural Section.* The planned, engineering design of layers of specified materials (normally consisting of subbase, base, and pavement surface) placed over the basement soil to support the traffic loads anticipated to be accumulated and applied during the design period. The structural section is also commonly called the pavement structural section.

(44) *Structural Section Drainage System.* Used with both flexible and rigid pavements, consisting of a treated permeable base layer and a collector system which includes a slotted plastic pipe encapsulated in treated permeable material and a filter fabric barrier with unslotted plastic pipe as vents, outlets and cleanouts to rapidly drain the pavement structural section.

(45) *Subbase.* A layer of aggregate, of designed thickness and specified quality, placed on the basement soil as the foundation for a base.

(46) *Subgrade.* The portion of the roadbed on which the pavement structural section is placed.

(47) *Tie Bars.* Deformed steel bars or connectors used to hold the faces of abutting slabs in contact.

62.8 Traffic

(1) *Annual Average Daily Traffic.* The average 24 hour volume, being the total number during a stated period divided by the number of days in that period. Unless otherwise stated, the period is a year. The term is commonly abbreviated as ADT or AADT.

(2) *Delay.* The time lost while traffic is impeded by some element over which the driver has no control.

(3) *Density.* The number of vehicles per kilometer on the traveled way at a given instant.

(4) *Design Vehicles.* See Topic 404.

(5) *Design Volume.* A volume determined for use in design, representing traffic expected to use the highway. Unless otherwise stated, it is an hourly volume.

(6) *Diverging.* The dividing of a single stream of traffic into separate streams.

(7) *Headway.* The time in seconds between consecutive vehicles moving past a point in a given lane, measured front to front.

(8) *Level of Service.* A rating using qualitative measures that characterize operational conditions within a traffic stream and their perception by motorists and passengers.

(9) *Merging.* The converging of separate streams of traffic into a single stream.

(10) Running Time. The time the vehicle is in motion.

(11) Spacing. The distance between consecutive vehicles in a given lane, measured front to front.

(12) Speed.

(a) Design Speed--A speed selected to establish specific minimum geometric design elements for a particular section of highway.

(b) Running Speed--The speed over a specified section of highway, being the distance divided by running time. The average for all traffic, or component thereof, is the summation of distances divided by the summation of running times.

(13) Traffic Control Devices.

(a) Traffic Markings--All lines, words, or symbols, except signs, officially placed within the roadway to regulate, warn, or guide traffic.

(b) Traffic Sign--A device mounted on a fixed or portable support, conveying a message or symbol to regulate, warn, or guide traffic.

(c) Traffic Signal--A power operated traffic control device except signs, barricade warning lights, and steady burning electric lamps, by which traffic is regulated, warned, or alternately directed to take specific actions.

(14) Volume. The number of vehicles passing a given point during a specified period of time.

(15) Weaving. The crossing of traffic streams moving in the same general direction accomplished by merging and diverging.

(16) Ramp Metering. A traffic management strategy which utilizes a system of traffic signals on freeway entrance and connector ramps to regulate the volume of traffic entering a freeway corridor in order to maximize the efficiency of the freeway and thereby minimize the total delay in the transportation corridor.

62.9 Drainage

See Chapter 800 for definition of drainage terms.